

Abstract: Disclosed in this invention is a hand-held computer device which accommodates and communicates with a variety of attachable modules for data acquisition (each module having an analog-to-digital converter and at least one connection for an associated analog sensor), wherein said hand-held computer device includes hardware controls and application software for interactive, synergistic, and real-time annotation by the user of the device during the data acquisition process, and wherein said hand-held computer device can communicate with another computer or network of computers for greater processing power, memory, or embedded programs. A further modification of the device disclosed herein allows calibration of the sensor readings to accommodate environmental or sensor-hardware variations that might otherwise complicate or even invalidate the data acquisition, or limit its utility. The hand-held computer device can be used by an individual to acquire data, annotate the process, calibrate the process, and analyze and act upon the results, thereby allowing an interactive, synergistic, real-time and event-driven approach to applications in the real world, including many specific uses in the fields of scientific inquiry, medical evaluation and treatment, lifestyle and health management, technical and inventory control, and security endeavors. Further disclosed are both the device and method for immediate analysis, feedback, and interaction action amongst the user, the hand-held computer device, a remote computer or network, or any combination thereof, whether such action is to correct failings in the sensors, the conversion process, the software, or the data acquisition process as a whole, or to put the analysis performed into immediate effect. Also disclosed are means for adapting the user- interface of the hand-held computer, whether such adaptation be to adapt to the preferences or needs of the user, the particular attachable module, the current or expected data acquisition process, or the method used to annotate, analyze, or act upon the results of data acquisition, analysis, or to communicate with a remote computer or

network. Also disclosed is the use of more than one hand-held computer with a attachable module and associated sensor(s) (whether the combination of each particular hand-held computer and attachable module and associated sensor(s) is identical or complementary), to gain greater real-time and context-based knowledge of and control over the environmental conditions and process than can be managed by a single point of static or dynamic reference. Finally, also disclosed are methods to use each of the above interactively, allowing synergistic adaptation on a real-time, real-world basis of computer and human sensing, evaluation, and action driven by a contextual awareness of both the environment and the process, which grants a flexibility that is impossible to obtain by any of automatic, remote, or manual methods acting separately.